

# Genalex

## BEAM TETRODE

### BRIEF DATA

A beam tetrode with an absolute maximum anode dissipation rating of 32 watts. The KT77 is designed for use in the output stage of an af amplifier. Two valves in Class AB1 give a continuous output of over 70 W. The KT77 is also suitable for use as a series valve in a stabilised power supply.

### HEATER

Heater voltage . . . . .	6.3	V
Heater current (approx) . . . . .	1.4	A

### MAXIMUM RATINGS

	Absolute	Design Max.	
DC anode voltage . . . . .	850	800	V
DC screen voltage . . . . .	650	600	V
DC anode and screen voltage . . . . .	650	600	V
Anode dissipation . . . . .	32	25	W
Screen dissipation . . . . .	6.0	6.0	W
Anode and screen dissipation . . . . .	35	28	W
DC cathode current . . . . .	200	180	mA
Heater-cathode voltage . . . . .	200	150	V
Negative dc grid voltage . . . . .	220	200	V
Grid-cathode resistor (cathode bias)			
$P_{a+g2} \leq 28 \text{ W}$ . . . . .		1.0	M $\Omega$
$P_{a+g2} > 28 \text{ W}$ . . . . .		0.5	M $\Omega$
Grid-cathode resistor (fixed bias)			
$P_{a+g2} \leq 28 \text{ W}$ . . . . .		0.5	M $\Omega$
$P_{a+g2} > 28 \text{ W}$ . . . . .		0.25	M $\Omega$
Bulb temperature . . . . .	250	230	°C

### CAPACITANCES (Measured on a cold unscreened valve)

Grid to anode . . . . .	1.0	pF
Grid to all other electrodes, less anode . . . . .	16.5	pF
Anode to all other electrodes, less grid . . . . .	9.0	pF

## CHARACTERISTICS

### Tetrode Connection

DC anode voltage . . . . .	250	V
DC screen voltage . . . . .	250	V
DC anode current . . . . .	110	mA
DC screen current . . . . .	10	mA
Mutual conductance . . . . .	10.5	mA/V
Internal anode resistance . . . . .	23	k $\Omega$
Inner amplification factor . . . . .	11.5	

### Triode Connection

DC anode and screen voltage . . . . .	250	V
DC anode and screen current . . . . .	120	mA
Mutual conductance . . . . .	11	mA/V
Internal anode resistance . . . . .	1050	$\Omega$
Amplification factor . . . . .	11.5	

## TYPICAL OPERATION

### Ultra-linear Connection. 43% Taps. Push-Pull. Class AB1. Cathode Bias

$V_b$ . . . . .	430	V
$V_{a, g2}$ . . . . .	390	V
$R_{g2}$ . . . . .	2 x 22	$\Omega$
$R_k$ . . . . .	2 x 470 $\pm 5\%$	$\Omega$
$R_L (a-a)$ . . . . .	6.0	k $\Omega$
$I_{a+g2} (o)$ . . . . .	2 x 66	mA
$I_{a+g2} (max sig)$ . . . . .	2 x 80	mA
$P_{a+g2} (o)$ . . . . .	2 x 26	W
$P_{a+g2} (max sig)$ . . . . .	2 x 14	W
$-V_{g1}$ . . . . .	31 (approx)	V
$V_{in} (g1-g1) (pk)$ . . . . .	69	V
$P_{out}$ . . . . .	34	W
$D_{tot}$ . . . . .	2.5	%

### Ultra-linear Connection. 43% Taps. Push-Pull. Class AB1. Fixed Bias

$V_b$	600	500	400	V
$V_{a, g2}$	594	493	391	V
$R_{g2}$	$2 \times 22$	$2 \times 22$	$2 \times 22$	$\Omega$
$R_{L(a-a)}$	9.0	5.5	4.5	k $\Omega$
$I_{a+g2(o)}$	$2 \times 47$	$2 \times 57$	$2 \times 70$	mA
$I_{a+g2} \text{ (max sig)}$	$2 \times 109$	$2 \times 126$	$2 \times 121$	mA
$P_{a+g2(o)}$	$2 \times 28$	$2 \times 28$	$2 \times 27.5$	W
$P_{a+g2} \text{ (max sig)}$	$2 \times 28$	$2 \times 28$	$2 \times 24$	W
$*-V_{g1} \text{ (approx)}$	56	43	31	V
$V_{in} (g1-g1) \text{ (pk)}$	94	82	61	V
$P_{out}$	72	67	45	W
$D_{tot}$	1.5	1.0	0.8	%

\*A bias adjustment range of  $\pm 25\%$  about these values should be available for each valve.

### Tetrode Connection. Push-Pull. Class AB1

The KT77 is designed primarily for use under ultra-linear conditions and this connection is recommended. However, similar performance can be obtained in the tetrode connected arrangement but the output impedance will be greatly increased. For tetrode connection the fixed screen supply must not exceed 300 V.

### Triode Connection. Push-Pull. Class AB1. Cathode Bias

$V_b$	430	V
$V_{a, g2}$	396	V
$R_{g2}$	$2 \times 22$	$\Omega$
$R_k$	$2 \times 440 \pm 5\%$	$\Omega$
$R_{L(a-a)}$	5.0	k $\Omega$
$I_{a+g2(o)}$	$2 \times 69$	mA
$I_{a+g2} \text{ (max sig)}$	$2 \times 75$	mA
$P_{a+g2(o)}$	$2 \times 27$	W
$P_{a+g2} \text{ (max sig)}$	$2 \times 20$	W
$-V_{g1}$	30 (approx)	V
$V_{in} (g1-g1) \text{ (pk)}$	66	V
$P_{out}$	18.0	W
$D_{tot}$	1.2	%

## LIFE PERFORMANCE

The average life expectancy of the KT77 when operated at absolute maximum ratings (see page 1) is at least 5,000 hours. At a reduced absolute rating  $P_{a+g2} = 25$  W a life of at least 10,000 hours should be obtained. The environment must be a static one and the valve should be switched not more than 12 times in each 24 hours.

A valve is considered to have reached the end of life when it is either inoperative or one or more of its characteristics have reached the following values:

Output power . . . . .	50 % of initial value
*Mutual conductance . . . . .	< 9.3 mA/V

\*Measured at :

DC anode voltage . . . . .	250	V
DC screen voltage . . . . .	250	V
DC anode current . . . . .	100	mA

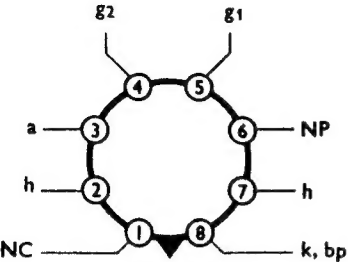
## INSTALLATION

The valve may be mounted in any position. Free air circulation around the valve is desirable.

When a pair of valves is mounted horizontally it is recommended that the centres of the valve sockets are not less than 9 cm (3½ in) apart and that the keyways on the spigots of each valve are in the vertical plane.

When a pair of valves is mounted vertically it is recommended that the centres of the valve sockets are not less than 9 cm (3½ in) apart and that the keyways on the spigots lie along the line joining the centres.

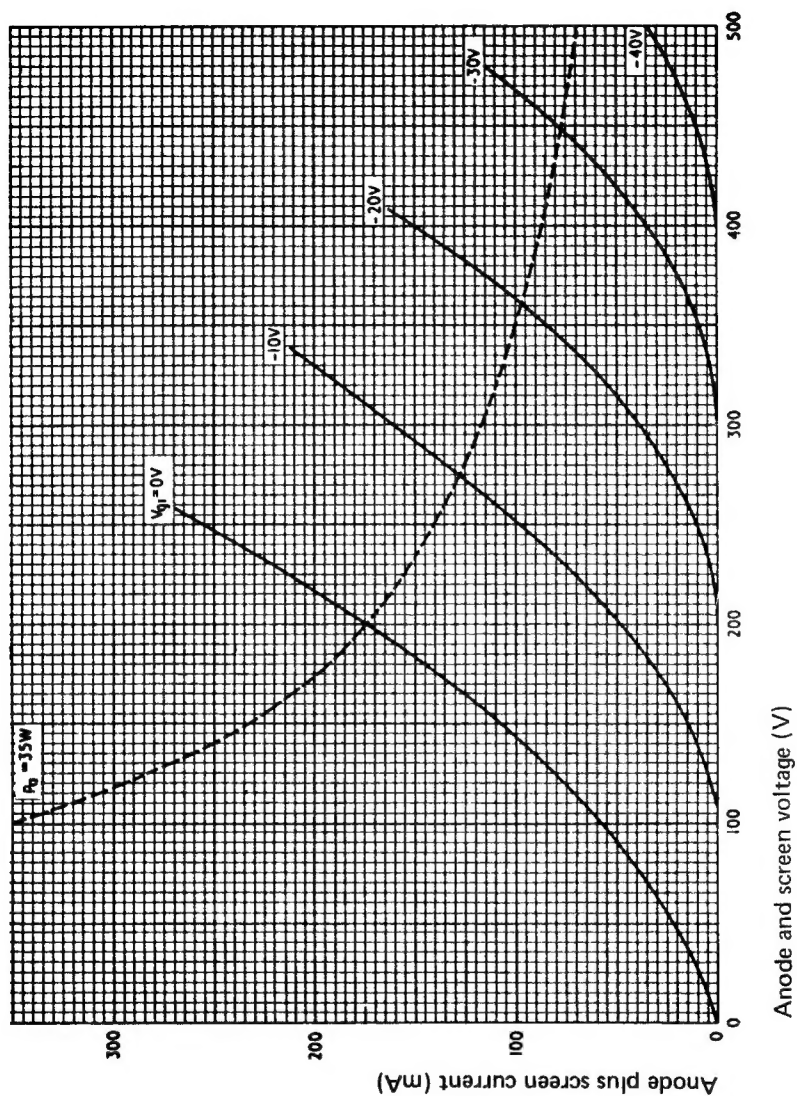
BASE CONNECTIONS AND VALVE DIMENSIONS



Base : International Octal (B8-0)  
Bulb : Tubular  
  
Max overall length : 113 mm  
Max seated length : 99 mm  
Max diameter : 33 mm

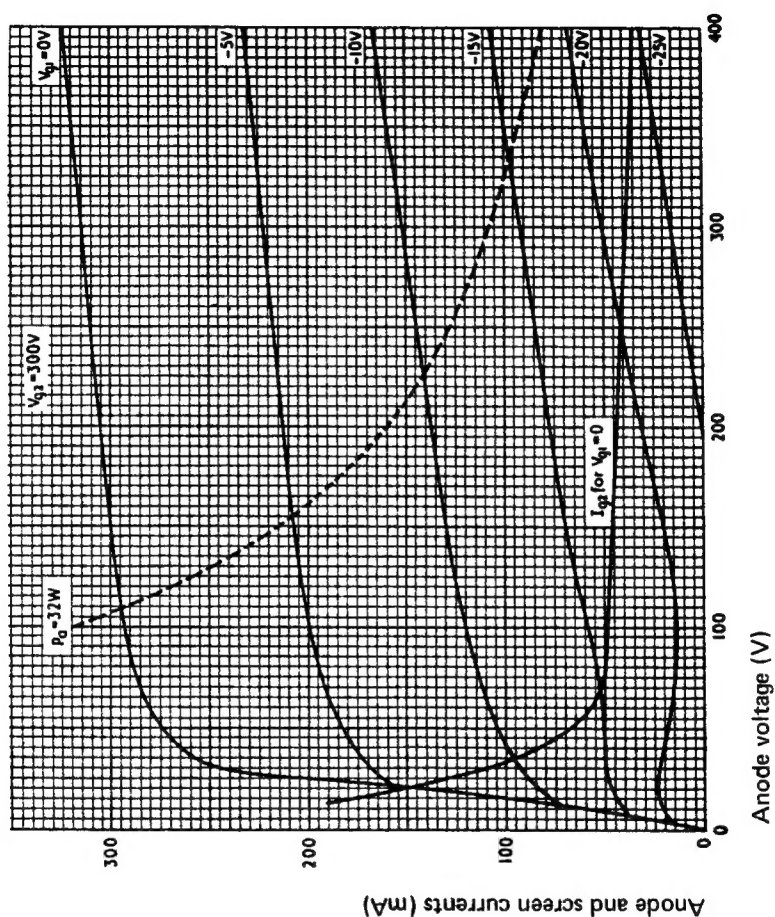
View from underside of base.

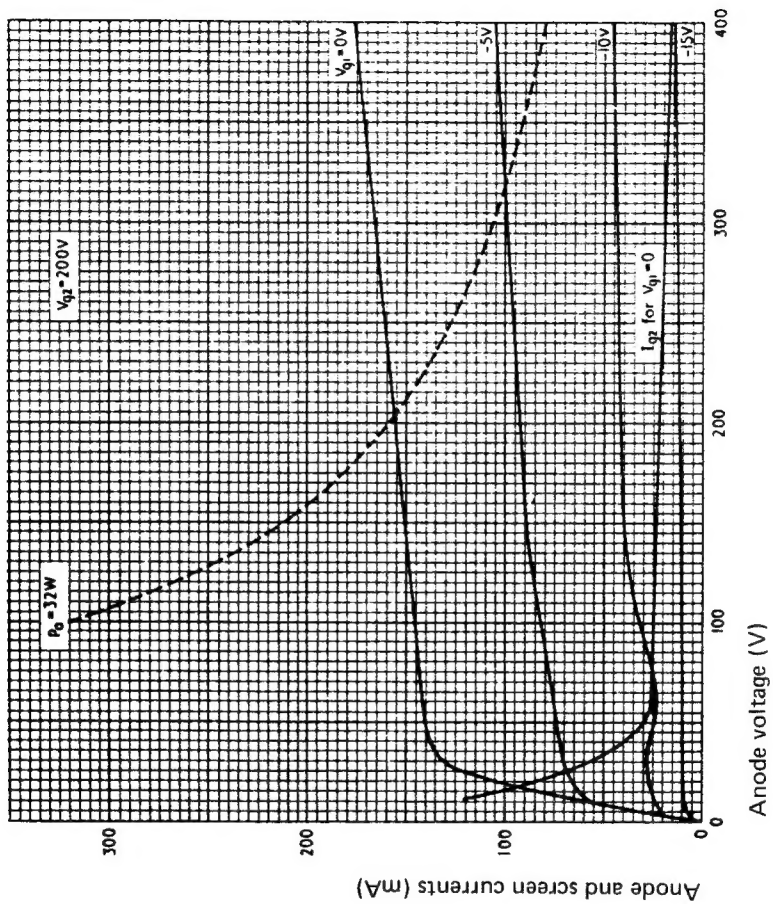
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Anode and screen voltage (V)

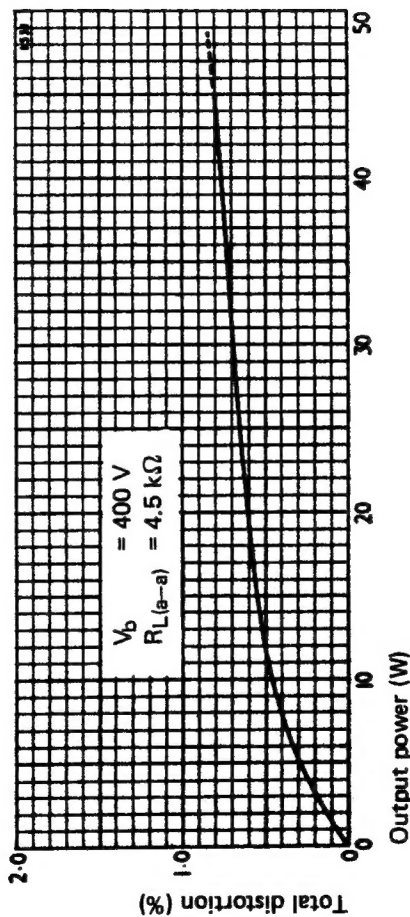
Anode plus screen current (mA)



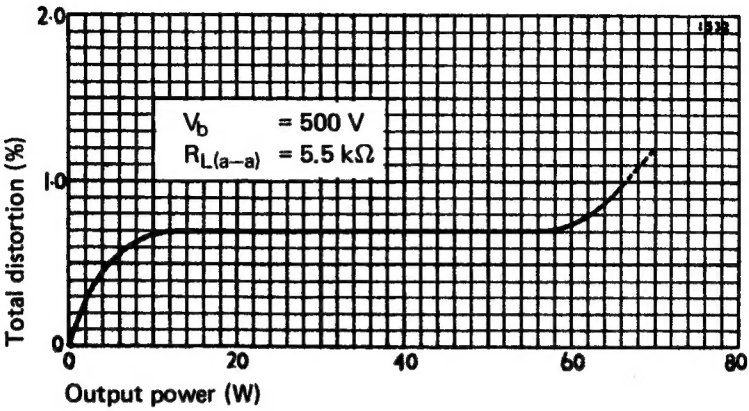




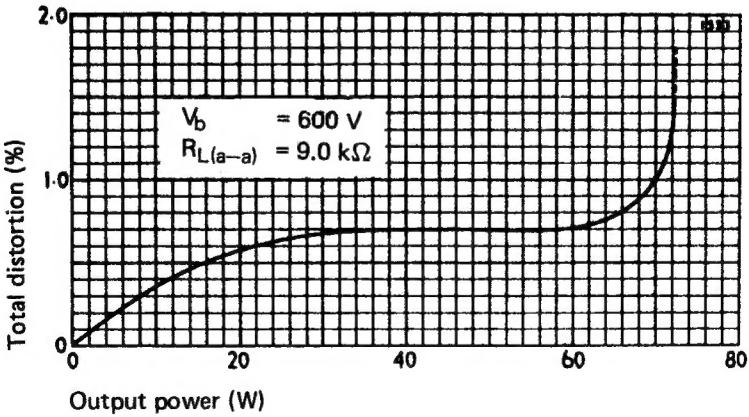
Ultra-linear connection. 43% taps. Push-pull. Class AB1. Fixed bias.



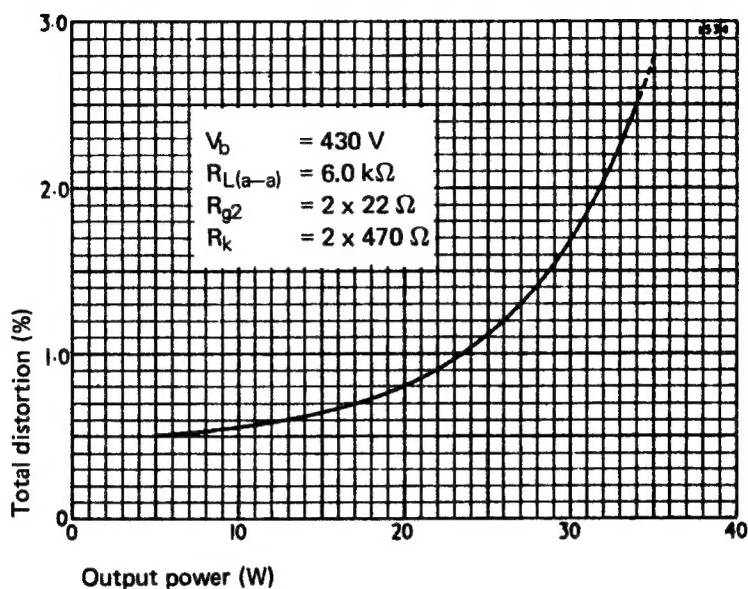
Ultra-linear connection. 43% taps. Push-pull. Class AB1. Fixed bias.



Ultra-linear connection. 43% taps. Push-pull. Class AB1. Fixed bias.



**Ultra-linear connection. 43% taps. Push-pull. Class AB1. Cathode bias.**



**Triode connection. Push-pull. Class AB1. Cathode bias.**

